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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/804,158	03/13/2001	Susumu Kawada	57454-037	8619

7590 03/22/2005

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EXAMINER

ROSASCO, STEPHEN D

ART UNIT	PAPER NUMBER
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1756

DATE MAILED: 03/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/804,158

Applicant(s)

KAWADA ET AL.

Examiner

Stephen Rosasco

Art Unit

1756

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 December 2004.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-7, 15-62 and 66-74 is/are pending in the application.  
4a) Of the above claim(s) 8-14 and 63-65 is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-7, 15-62 and 66-74 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 13 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

Tin response to the filing of this RCE, the examiner withdraws all previous office action rejections and includes new rejections here based on newly cited art.

The status of the claims 1-74 is:

1-7, 66-72 and 74	phase shift film
8-14	withdrawn
15-26 and 73	Blank for a phase shift mask
27-37	Process for making phase shift mask blanks
38-44	Phase Shift Mask
45-59	Process for making a phase shift mask
60	Exposure method using a phase shift mask
61-62	Semiconductor Device
63-65	withdrawn

The following claims are objected to because of the following informalities:

Claims 50-59, line1 "process for a" should be –process for making a-.

Claim 74 reads the phase shifter mask according to claim 1, but claim 1 is to a film not a mask.

Claim 32, line 2, "wherein said step of formed blanks", "formed" is incorrect.

Appropriate correction is required.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-7, 15-62, 66-74 are rejected under 35 U.S.C. 102(e) as being anticipated by Hu (5,725,739) or Chang et al. (6,458,255).

The claimed invention is directed to a phase shifter film used for making a phase shift mask, and also to the mask, blank, method of making both and method of using the mask: characterized in that said phase shifter film is a film formed by using a reactive long throw sputtering device.

And wherein said phase shifter film is made of a molybdenum silicide oxide nitride.

Hu teaches (see claims 1-18) a method for depositing a material, comprising an alloy or a composite, into a recess, having an upper and lower surface, the method comprising the steps of: sputtering from a target, comprised of the material, onto the upper surface to form a layer of deposited material.

And wherein the target is comprised of an alloy or composite material, selected from the group consisting of: refractory metal silicides, magnet alloys, alloys used in micromachining manufacturing processes, and silicide composites.

And wherein the target is comprised of titanium silicide, having a ratio of silicon to titanium between approximately 2.0:1 and 2.7:1.

And further comprising the step of annealing the titanium-rich titanium silicide to reduce native oxides and form a low resistivity contact.

And wherein the sputtering and resputtering steps comprise utilizing a noncollimated, long-throw physical vapor deposition sputtering apparatus, with a substrate-to-target distance of approximately between 100 to 1,000 millimeters.

Chang et al. teach a method of producing a sputtered Ta.sub.x N.sub.y film having a resistivity of less than 25 .mu..OMEGA.-cm, wherein x is 1 and y ranges from about 0.05 to about 0.18, said method comprising: placing a substrate on a temperature-controlled support platen in a physical vapor deposition process chamber; and controlling a temperature of said support platen during sputtering of said Ta.sub.x N.sub.y film upon said substrate, wherein said substrate temperature is about 165.degree. C. or higher during deposition of said sputtered Ta.sub.x N.sub.y film, and wherein said sputter deposition is high density plasma sputter deposition, and a surface of said Ta.sub.x N.sub.y film is ion bombarded during said deposition.

Chang et al. also teach (see esp. cols. 7, 8) :

The term "long-throw sputter deposition" refer to a sputter deposition technique which utilizes conventional, non-collimated magnetron sputtering at low pressures, where the distance between the target and the substrate is equal to or greater than the diameter of the substrate. Long-throw (gamma) sputter deposition enables control of the degree of directionality in the deposition of film layers, resulting in improved step coverage as compared with conventional magnetron sputtering.

FIG. 4 is a graph showing the resistivity of a sputter-deposited Ta.sub.x N.sub.y film (deposited using long-throw or high density plasma techniques) as a function of the substrate platen heater temperature during deposition of the film, wherein x is 1 and y ranges from about 0.05 to about 0.18.

**Conclusion**

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Stephen Rosasco whose telephone number is (571) 272-1389. The Examiner can normally be reached Monday-Friday, from 8:00 AM to 4:30 PM. The Examiner's supervisor, Mark Huff, can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'S. Rosasco', with a stylized, flowing script.

S. Rosasco  
Primary Examiner  
Art Unit 1756

S. Rosasco  
03/18/05